

REMARKS

The title has been changed and the specification has been amended as requested by the examiner. It is noted that the title was in fact changed in the response filed July 30, 2001.

Claims 1, 3, 4, 6, 8 to 18 and 21 have been objected to. Claims 1 and 4 have been amended accordingly.

Claims 1, 3, 4, 6, 8 to 18 and 22 have been rejected as based on new matter. According to the examiner, no support has been found for the membrane being prestressed.

Submitted herewith are declarations from one of the inventors, Baird-Smith, and Mr. Page, a Chartered Mechanical Engineer.

Both parties declare that there are numerous references in the application as filed to the flexible member being pre-stressed. The term "stressed" as used in this application, means "compressed" or acted on by a force that tends to change the dimensions of a material to cause a strain. Stress may be in a direction parallel or perpendicular to the plane of the member. In the present application, the stress is in a direction perpendicular to the plane of the flexible member. The term "pre-stressed" therefore means compressed before or during the manufacture of the container assembly.

The examiner's attention is called to page 4 of the amended International patent specification, the first statement of invention, which is the second full paragraph on page 4, wherein it is stated that "the resiliently deformable member presses the flexible membrane against the container in the vicinity of the seal". This clearly shows that a force is provided by the position of the rigid closure, and hence the resiliently deformable member relative to the flexible membrane, which acts on the flexible membrane to compress the flexible membrane in a direction substantially at right angles to the plane of the flexible membrane. In other words, the flexible membrane is pre-stressed.

Further, in the immediately following paragraph, it is stated that the resiliently deformable member reacts against the rigid closure to continuously and evenly reinforce the seal (because the flexible membrane is pre-stressed). Also, in the second statement of the invention, on page 5, lines 13 to 25, it is stated that "thereby causing the resiliently deformable member to press the flexible member against the container in the vicinity of the seal sufficiently to maintain the seal against pressures generated in the container on heating of its contents". For the reasons set out herein above, in paragraph 13, this also shows that the flexible member is pre-stressed.

On page 10, lines 18 to 23, it is stated that "thus on tightening of cap 12, resilient, annular member 24 presses membrane 11 into tight, sealing contact with flange 18. This seal is capable of withstanding pressures developed within the can 10 during cooking of food products therein". The reason that the seal is capable of withstanding such pressures is because the flexible membrane 11 is pre-stressed due to the fact that the cap bears down on the annular member and reacts against the resiliently deformable member.

In the immediately following paragraph beginning at line 25 it is stated that, during the cooking, "the annular member 24 'continues to press down' on the seal between membrane 11 and flange 18 thereby providing additional reinforcing of the seal". This shows that the force applied to the flexible membrane ¹¹42 was applied before the cooking process began and therefor the flexible membrane 11 is pre-stressed.

Referring now to the last paragraph on page 11, it is stated that, before cooking of the food products, a cap is tightened onto the end of the can 10 "until annular member 24 presses membrane 11 against flange 18 with a predetermined pressure". In other words, in the assembly process of the contained assembly, the process of putting the cap onto the can requires a torque to tighten the cap. This torque produces a predetermined pre-stress. The level of the pre-stress relates to the material properties of the resilient material.

Thus, there is no new matter and there is adequate support at various locations in the specification for the membrane being pre-stressed.

Claims 1, 3, 4, 6, 8 to 18 and 22 have also been rejected as indefinite.

The membrane is inherently prestressed. Claim 1 clearly recites that the cap has a resiliently deformable member juxtaposed to the flexible prestressed membrane pressing the same against the container in the vicinity of the seal.

Claims 1 and 12 have been amended to clarify the function of the seal. Claim 4 has been corrected to avoid rejection as indefinite and to depend from claim 1.

Claims 1, 3, 4, 6 and 8 to 18 have been rejected as unpatentable over Hiroshi in view of Brophy.

The examiner states that Hiroshi does not teach that the membrane is pre-stressed. However, as previously pointed out to the examiner, there is no disclosure in Hiroshi that the ring member 6 is deformable. By assuming that the component 6 in Hiroshi is deformable, the examiner is gleaning more from the document than what the disclosure warrants.

The examiner has stated that it would be obvious to one of ordinary skill in the art to make the spacing between the laminar member and the flexible membrane less than the maximum possible extension of the deformable member towards the laminar member to prevent rupture of the flexible member due to excessive pressure within the closed can. However as already explained previously to the examiner, the can disclosed in Hiroshi is not designed to withstand high pressures building up from within the can, but rather to withstand high pressure building up outside the can. It is therefore irrelevant in Hiroshi what the gap is between the laminar member and the flexible membrane as in Hiroshi any deformation of the flexible member would be towards the inside of the can and therefore away from the lid of the can.

It is clear from Hiroshi that there is nothing which limits the deformation of the flexible membrane in a direction towards the inside of the can and therefore it is not clear why it would be obvious to a person skilled in the art to make the spacing between

the laminar member and the flexible member in Hiroshi less than the maximum possible extension of the deformable member towards the laminar member.

The examiner has additionally cited Brophy as teaching a pre-stressed membrane closure for resisting deformation due to pressure created in the associated container. Brophy relates to a rotary regenerative air preheater and therefore to a completely different art to that of Hiroshi. It would not be obvious to a person skilled in the art of container closures to look to Brophy and then to decide to combine the teachings of Brophy with the teaching of Hiroshi. Even if it were obvious to do so, one would not arrive at the invention as claimed in claim 1 of the present application. In Brophy, a membrane 52 is welded to the interior surface 56 of a basket cover 54. The basket forms part of a rotary heat exchanger. The membrane 52 is composed of the same material as the cover 54. The membrane 52 is pre-stressed in a tensile sense and therefore resists deformation in a direction perpendicular to the plane of the membrane. In contrast however, in the presently claimed invention the flexible member is pre-stressed in a direction perpendicular to the plane of the member (see the enclosed declarations of Baird-Smith and Page) and the pre-stress actually causes deformation of the flexible member in a direction perpendicular to the plane of the member in a reaction to forces acting on the flexible member from within the can. This deformation of the flexible member in turn causes deformation of the member 11 because of the forces bearing down on membrane 11 which strengthens the seal between the can body and the can lid.

If one skilled in the art attempted to combine the teaching of Brophy with the teaching of Hiroshi, he would be encouraged to pre-stress the flexible member in a tensile sense and to apply the flexible member over the surface of the membrane to prevent the membrane 11 from deforming due to the pressures created within the can. In fact, in the presently claimed invention the membrane 11 must deform the cooking process to accommodate changes in pressure during the cooking process and hence the presence of the disk 21 prevents rupture of the membrane. By applying the teaching of

Brophy to Hiroshi, such deformation would be prevented and therefore one would not therefore arrive at the invention as claimed.

As for claim 14, there is no mention or suggestion in Hiroshi that a resiliently deformable layer presses against a flexible membrane in the vicinity of the seal to sufficiently maintain the seal against pressures generated in the container on heating of its contents. In addition, for the reasons set out herein above, Brophy does not disclose such a pre-stressed membrane, and also relates to an entirely different art to that of the present invention and that of Hiroshi. It would therefore not be obvious to a man skilled in the art to combine the teachings of Brophy with the teachings of Hiroshi. Even if it were obvious one would not arrive at the invention as claimed in claim 14. The remaining claims are dependent from allowable claims are thus allowable.

As a further ground of invention, the examiner has also stated that claims 1, 3, 5, 6, 9 and 12 to 18 are unpatentable over Owen in view of Brophy. Owen discloses a method of sealing a plastic container in a way which attempts to overcome problems of container collapse and bubble formation in the contents and/or at the interface between the container and the contents. The container is designed to hold foodstuffs which generally tend to cause wall collapse in the plastic container in which they are packaged due to their tendency to either contract during temperature changes or absorb of otherwise take up oxygen. These foodstuffs include mustard, mayonnaise, semi-solid salad dressing and the like. The container is also designed to hold foodstuffs which are susceptible to the formation of bubbles, such as jelly, jam, hot fill non-carbonated fruit drinks, marmalade fruit butters and the like. The container is thus designed to cope with a lower pressure within the container than outside the container as shown clearly in Figures 3 and 4 of the application. It is not designed to withstand high pressure build up from within the container and therefore there is no disclosure in Owen to state that a laminar member is spaced from flexible membrane by distance less than the maximum possible extension of the flexible member towards the laminar member. In this respect, the examiner's attention is directed to the comments above in relation to Hiroshi. In

addition, there is no mention nor suggestion that there is any need to have the flexible member pre-stressed in order to bear down on the deformable membrane.

Further, Brophy does not teach a pre-stressed membrane of the type disclosed in the present invention as claimed for the reasons set out herein above, and it would not be obvious to combine the teachings of Brophy with those of Owen because Brophy relates to such a different art.

As still another ground of rejection, claims 1, 3, 4, 6, and 9 to 18 have been rejected as unpatentable over Shull in view of Brophy. Shull relates to a molded plastic closure cap, and the comments above relating to the relevance of Brophy apply equally in respect of the examiner's combining the teachings of Brophy with Shull. Further, the seal disclosed in Shull is completely different to the seal claimed in the present application.

Claims 1, 3, 5, 6 and 9 have also been rejected as unpatentable over Revill in view of Brophy. Revill relates to a container sealing device and method for sealing containers. The container seal disclosed therein is completely different to that claimed in the present application.

Finally, still another rejection is used by rejecting claims 1, 3, 4, 6, 8 to 18 and 22 as unpatentable over Aulbach in view of both Hiroshi and Brophy. For the reasons set out above, it is inappropriate to combine the teachings of Brophy with the teachings of patents relating to cans or containers. In addition, for the reasons set out above, it is believed that the examiner has misinterpreted the teachings of Brophy.

Further, Aulbach was published on 31 May 1927, and describes a container particularly a tinned can having a frangible access maybe had to the contents by breaking the seal. This is in sharp contrast to the container disclosed in Hiroshi in which the membrane is able to withstand treatment under high pressure at temperatures of 100°C or over. Since the disclosure of Aulbach is not directed to such containers it is hard to see why it would be obvious to one of ordinary skill in the art to substitute a heat sealed or adhesively applied membrane to the seal member of Aulbach. There

would be no incentive from the teaching of Aulbach to make such substitution. The examiner's comment that to do so would make the use of the sealed container easier by rendering an opening tool unnecessary are not understood, since it is stated in Aulbach (column 2, line 108 to column 3, line 2) that in order to extract the contents of the container it is merely necessary to break or cut the sealing member 3 which may be of paper, metal or other frangible breakable or severable air tight material. In other words, the seal may be broken by, for example, inserting a finger through the seal.

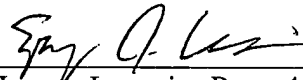
It is concluded that an important feature of the present invention is to enable the container to withstand high forces built up from within the container. None of the other "seal patents" cited or applied by the examiner discloses such a container.

It is noted that the CAFC in *McGinley v. Franklin Sports, Inc.*, 60 USPQ 2d 1001, August 21, 2001, the CAFC clearly stated that strong teachings must be present when combining two or more patents to show obviousness. The examiner must back up his conclusionary statements with sufficient reasoning to justify combining references. *See, In re Lee*, 61 USPQ 2d 1430, CAFC January 18, 2002.

For these reasons, all claims are allowable and such action is respectfully requested.

Respectfully submitted,

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Enclosure: Marked Up Claims to Show Changes
Declarations (2)

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

TECHNOLOGY CENTER R3700

In the Claims

1. (Thrice Amended) A container closure for an open-ended container comprising:

(i) a pre-stressed flexible membrane for closing the open end of the container;

(ii) a seal [disposed to lie] provided, in use of the closure, between the flexible membrane and a container;

(iii) a rigid cap having a resiliently deformable member juxtaposed to the flexible membrane in use of the closure, the resiliently deformable member in use pressing the flexible membrane against the container in the vicinity of the seal, thereby reinforcing the seal sufficiently to withstand pressures generated on heating of the contents of the container;

wherein, the rigid cap includes one of a cam and follower pair engageable in use of the closure with the other of a cam and follower pair on a said container, including a neck, that is closeable by the closure relative movement between the cam and follower in a predetermined direction causing the rigid cap and the container neck to approach one another, thereby increasing the pressure exerted by the resiliently deformable member on the flexible membrane,

the rigid cap further including a laminar member and an annular skirt depending downwardly therefrom, the cam or the follower being secured on the upper wall of the skirt,

and wherein the laminar member is spaced from the flexible membrane by a distance less than the maximum possible extension of the flexible member towards the laminar member.

4. (Thrice Amended) A container closure according to [any preceding] claim 1 shaped to close a container, said container including a neck having an annular flange for defining part of the said seal, the resiliently deformable member being, in use of the

closure, substantially congruent with the flange whereby the resilient member presses the flexible membrane against the flange.

12. (Fourth Amended) A combination of an open-ended container and container closure therefore comprising:

(i) a pre-stressed flexible membrane for closing the open end of the container;

(ii) a seal [disposed to lie] provided, in use of the closure, between the flexible membrane and a container;

(iii) a rigid cap having a resiliently deformable member juxtaposed to the flexible membrane in use of the closure, the resiliently deformable member in use pressing the flexible membrane against the container in the vicinity of the seal, thereby reinforcing the seal sufficiently to withstand pressures generated on heating of the contents of the container;

wherein, the rigid cap includes one of a cam and follower pair engageable in use of the closure with the other of a cam and follower pair on a said container, including a neck, that is closeable by the closure relative movement between the cam and follower in a predetermined direction causing the rigid cap and the container neck to approach one another, thereby increasing the pressure exerted by the resiliently deformable member on the flexible membrane,

the rigid cap further including a laminar member and an annular skirt depending downwardly therefrom, the cam or the follower being secured on the upper wall of the skirt,

and wherein the laminar member is spaced from the flexible membrane by a distance less than the maximum possible extension of the flexible member towards the laminar member, said container being a metal or composite can.